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## LARGE GLACIAL BOWLDERS

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Mention of large glacial bowlders is not uncommon. In fact most localities glaciated have their "largest in the state." Some lie so as to reveal easily the fact that they have been transported. Others are more or less concealed, and some care is needed to determine whether the rock is really a transported mass or country rock in place.

A mass of limestone in Ohio covering about three-quarters of an acre, and in places sixteen feet or more in thickness, was mentioned by Orton in one of the older reports of Ohio geology and cited by Dana.<sup>1</sup> In the Alps was found a mass containing about 200,000 cubic feet of rock or enough to cover a fourth of an acre twenty feet deep.<sup>2</sup> Sardeson<sup>3</sup> reports a block of limestone moved a short distance whose width was over 100 feet, thickness several feet, and length unknown. Limestone bowlders, often large masses, are quite common in parts of Illinois, specifically in western Livingston County, in northern McLean, and in parts of Champaign, Ford, and Vermilion counties. Following is a detailed description of several masses or "pockets" of this rock which have been studied.

On the south side of the Champaign-Ford county line one and one-half miles east of the northwest corner of Ludlow township are the remains of a large "pocket." H. H. Atwood of Paxton who owns the farm says several loads of the rock have been drawn away for building purposes, but enough remains to mark the place distinctly.

Near Saybrook, McLean County, are a number of localities where limestone is found at the surface. On the farm of Mr. Riggs,

<sup>1</sup> J. D. Dana, *Manual of Geology*, 5th ed. (1895), 960.

<sup>2</sup> *Ibid.*, 248.

<sup>3</sup> *Jour. Geol.* (1905), XIII, 351-57.

one mile north and one and one-half miles west of Saybrook, lime was burned forty or fifty years ago. A small kiln was built and operated several years with rock from this deposit. A half-mile east of this kiln, past the schoolhouse, another "pocket" was opened and several loads drawn some thirty-five years ago. At present but few know of these limestone pits, for they have been entirely dug out and the holes are plowed over. Portions of the kilns and fragments of waste alone remain.

Two miles north and one mile west from Saybrook are a number of slabs resembling flagging. These are quite numerous on one farm. On a farm ten miles west of Saybrook lime was burned for the local market, but at present the rock is apparently exhausted. In this locality, a good many loads for foundations and well curbs have also been drawn away. According to a boring for Mr. H. Cheney of Saybrook, bed rock was struck here at a depth of 236 feet. It is recorded that a five-foot limestone boulder was struck in a gravel bed at a depth of 150 feet. A well digger here in conversation said that in digging wells he frequently encountered limestone bowlders of various sizes, and noted several localities where the boulder weighed from ten to twenty tons. A number of wells in the vicinity have been walled with the rock taken out in digging, supplemented with more found near by. "In fact," he says, "there is lots of limestone scattered all over the country." No bed rock, however, has ever been found about Saybrook except at considerable depths as in the well cited, 236 feet.<sup>1</sup> With such thickness of drift as this, these masses of limestone cannot be in place.

The largest drift mass of limestone is in Livingston County, about a mile and a half southwest of Fairbury, where Dr. Brewer has been taking out a great deal of limestone. The mass is along a small stream where the water divides, flowing around a little island. On the north bank of the south division and on both banks of the north division, rock is found; but on the extreme south bank no rock is known, nor is rock struck in any wells on the south side of the stream. Along the stream on the north side for

<sup>1</sup> Frank Leverett, *U.S.G.S. Mon.* 38, 695, reports a boring for coal here reaching rock at 247 feet.

*a half-mile or more, and back from the stream a half-mile, all wells strike rock at some twelve to sixteen feet.* Below the rock at the quarry is clay, a soft sticky yellow body, called by the quarrymen "soap-stone." Examination showed it to be glacial drift. No large pieces of rock can be obtained in the quarry, for the whole mass is shattered. The pieces vary in size from ten or fifteen to two hundred and fifty pounds, rarely larger than can be handled by one man. At the quarry the rock is from ten to fifteen feet thick, and two or three nearby wells are reported passing through it, one finding sixteen feet of rock.

The rock seems to be almost exactly horizontal in the quarry, and it is struck at quite uniform depths in the neighboring wells. Inquiry for this stratum in the coal shafts, two in number, at Fairbury, failed to reveal its presence. One about a mile distant encountered a piece of rock at a depth of forty feet, but below it was more clay. The other about one and one-quarter miles distant found no rock for at least ninety feet.

At McDowell a little quarry is operated in rock which has almost precisely the same characters as the one at Fairbury, but it is of less extent—ten or twelve feet thick, shattered and local. West and south of McDowell about two miles from Ocoya there are two or three little quarries opened. One near a little stream is operated by two men who have taken out over a hundred cords of rock in a single summer. The rock is eighteen feet thick at a maximum, but in places only five or six feet thick. Some parts of it are shelly or shattered, but toward the bottom, this mass is firmer than any other yet considered. Sometimes pieces twelve to sixteen inches thick and six to eight feet long are removed, but no blasting is done. The near proximity to the stream caused some trouble with water seepage, so a sumpf was dug through the rock and a pump put in. A crowbar was thrust down easily in the bottom of this sumpf two or three feet. The quarrymen say the substratum is "soapstone of variable character," but it seems to be a well-packed, blue, pebbly clay with a greasy feel. That it is not one of the soft argillaceous layers of the Coal Measure rocks is shown by its pebbles. The edge of the rock is known in two directions. The edge along the stream is slanting, the other,

nearly at right angles thereto and on the east end of the quarry, is perpendicular and very regular. Rock is struck in but one well in the vicinity. Rock has been taken out from similar, though smaller local pockets, in two other localities within 80 rods.

The county surveyor of Livingston County says there are a good many local deposits along the Vermilion River, slabs, bowlders, and irregular pieces, but it is not continuous, and the layers are variously tilted.

Usually these large masses are along morainal ridges. Sometimes they are found along stream beds where they have been exposed by erosion. They cover areas varying from a few rods to over a hundred acres in extent, and differ in thickness from six or eight feet to eighteen or twenty feet. They are always in a shattered condition; often very much broken up, but sometimes requiring some blasting to get out the rock. What seems the most surprising thing is that there is rarely much dip. The bedding in all the larger masses is almost horizontal. During early days when transportation was expensive, these masses of limestone were much used by the settlers, who made lime from some of them, and from others drew building material. The rock was more workable, and hence more desirable, than the granite bowlders.

Their presence in the drift, and their distribution mostly in the large recessional moraines, seems to point to a glacial origin for them. Since most if not all the masses mentioned are of Carboniferous rock, as shown by their fossils, the sources could not have been more than fifty to seventy-five miles north, for beyond that limit there is no Carboniferous rock, from which they could have come. While no specific places have been found from which it is thought these large bowlders were plucked, it is believed that they may have come readily from the bluffs of a valley, or from hills a moderate distance to the north.